

Fig. 1
Surface modification scheme

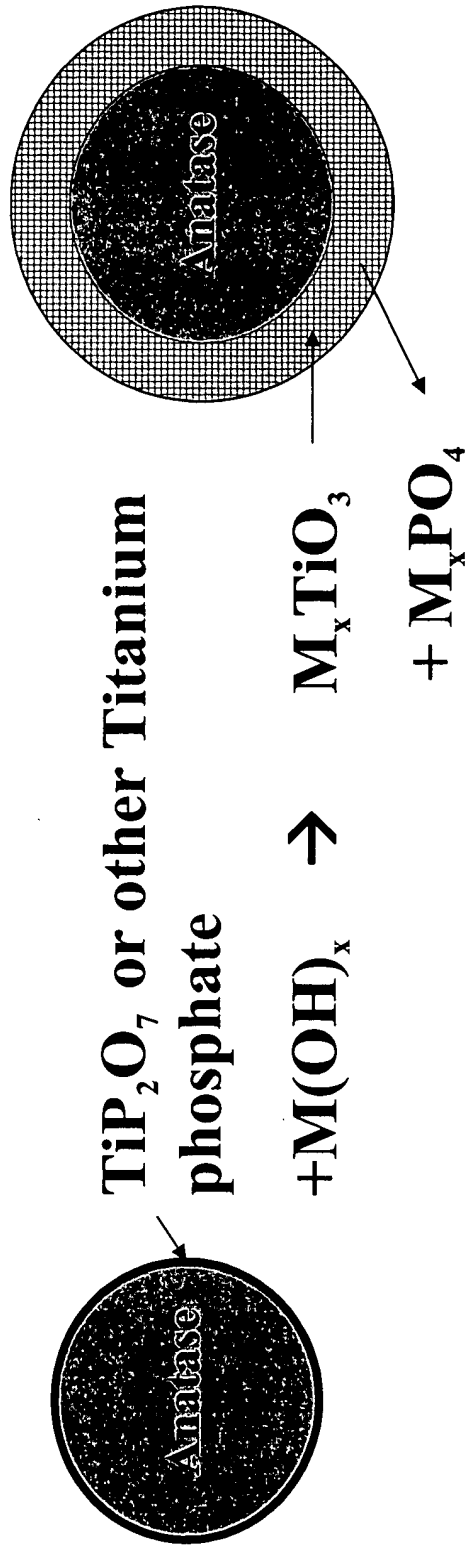


Fig. 2

Surface modification step 1 - Creating a titanate layer on an anatase nanoparticle in an aqueous slurry. M is an alkali metal.

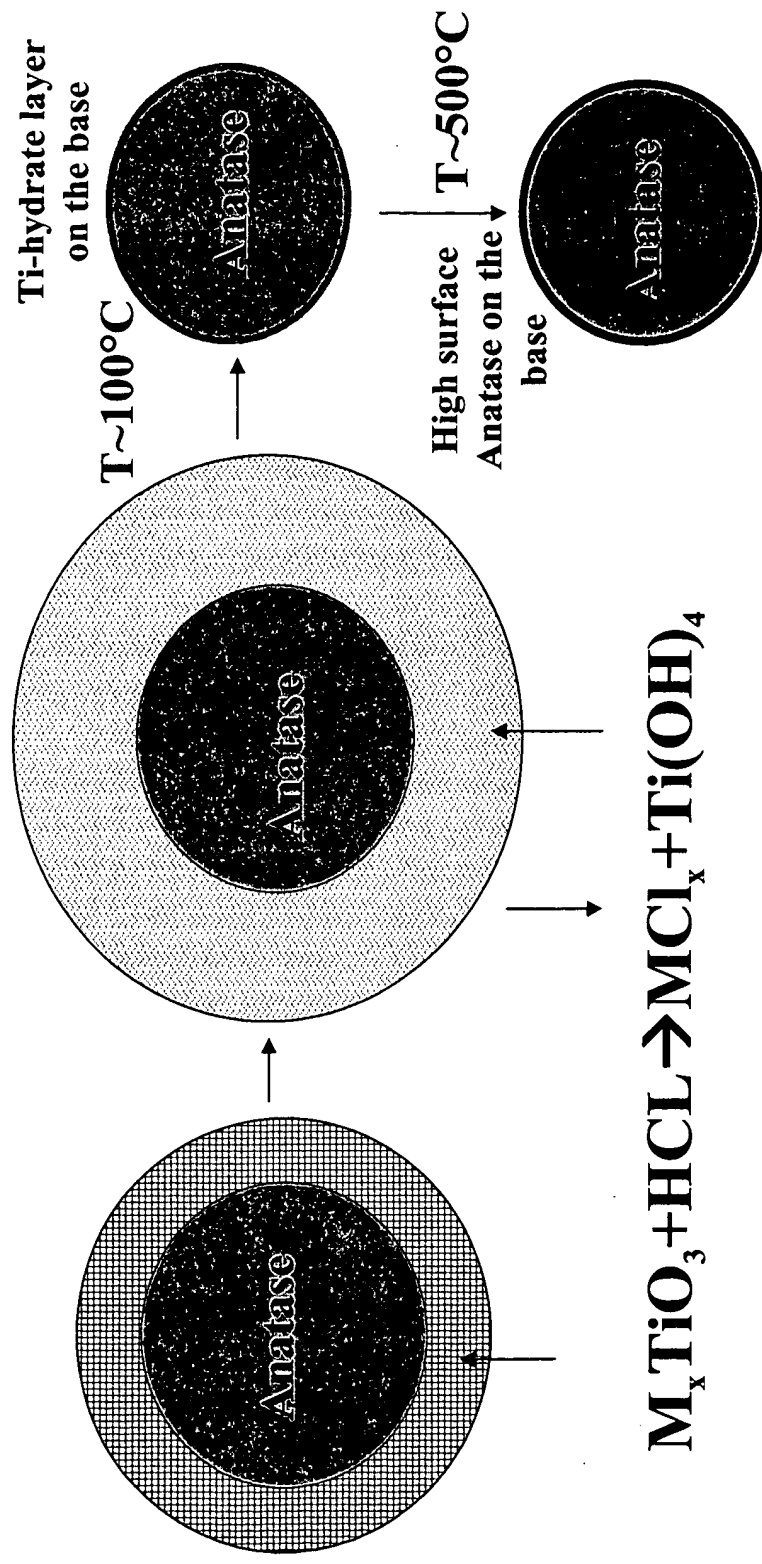


Fig. 3

Surface modification step 2: Conversion of the alkali metal titanate layer into a Ti-hydrate gel layer and further calcining

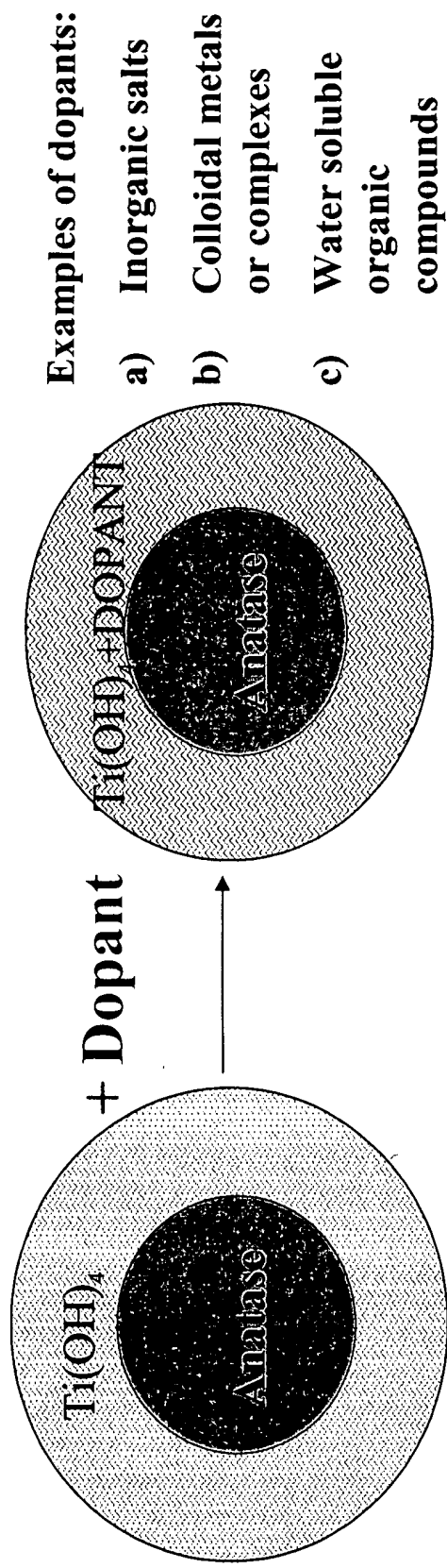


Fig. 4

Doping of the gel layer on the base.

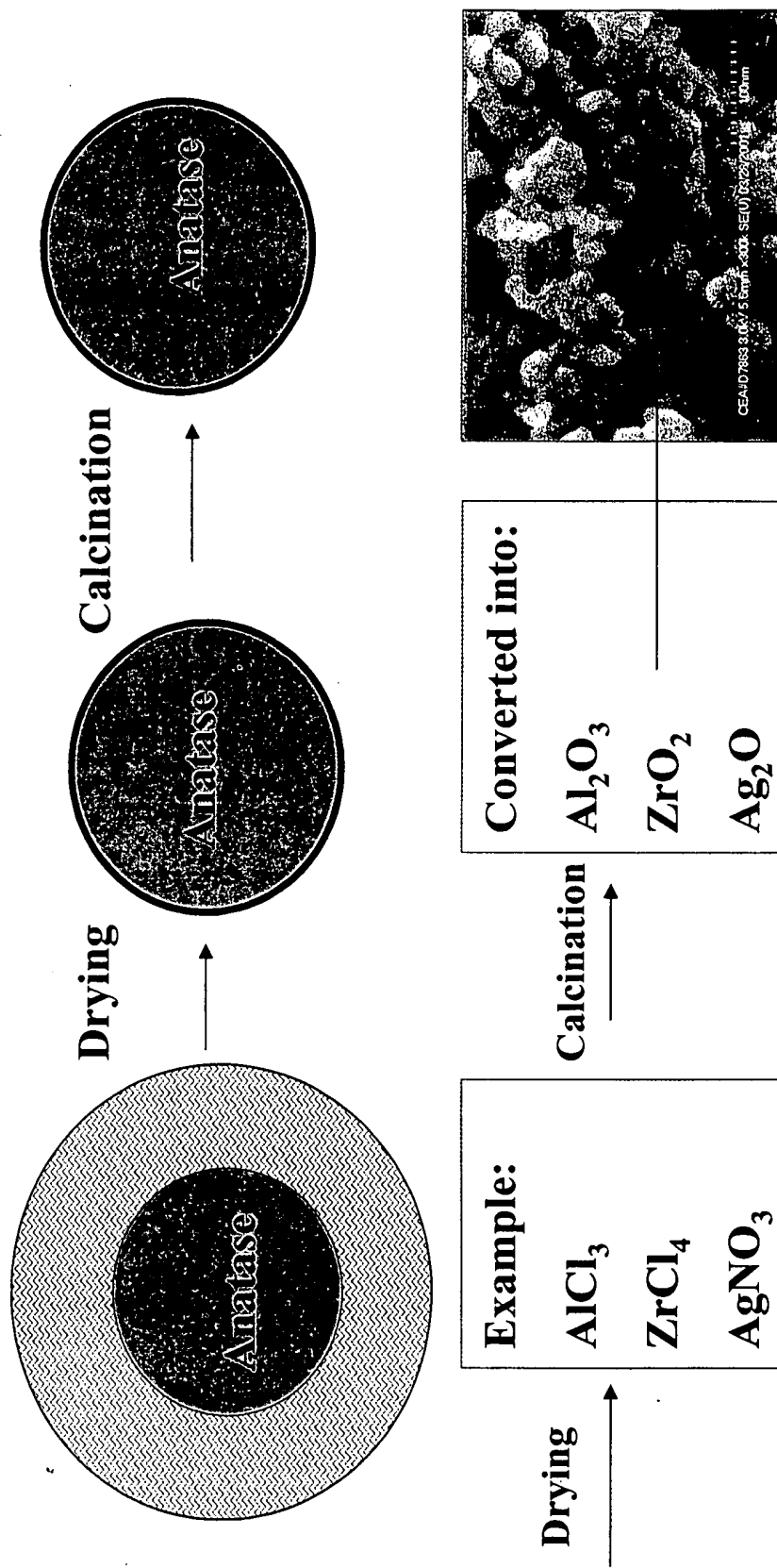


Fig. 5a

Fig. 5b

Drying of the doped material and conversion of the dopant in a calcination step

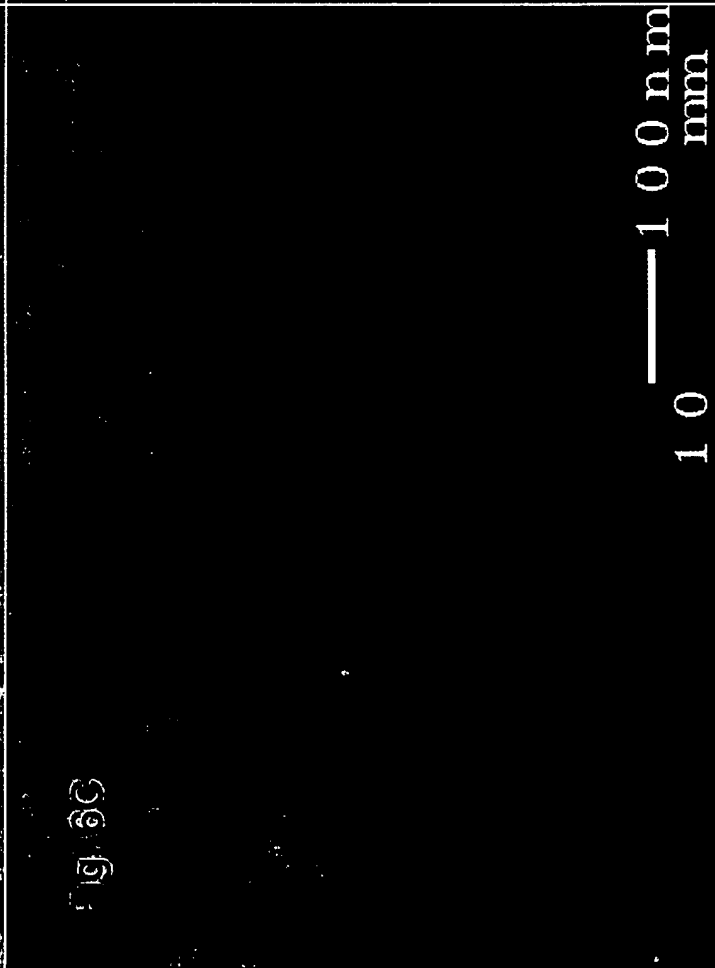
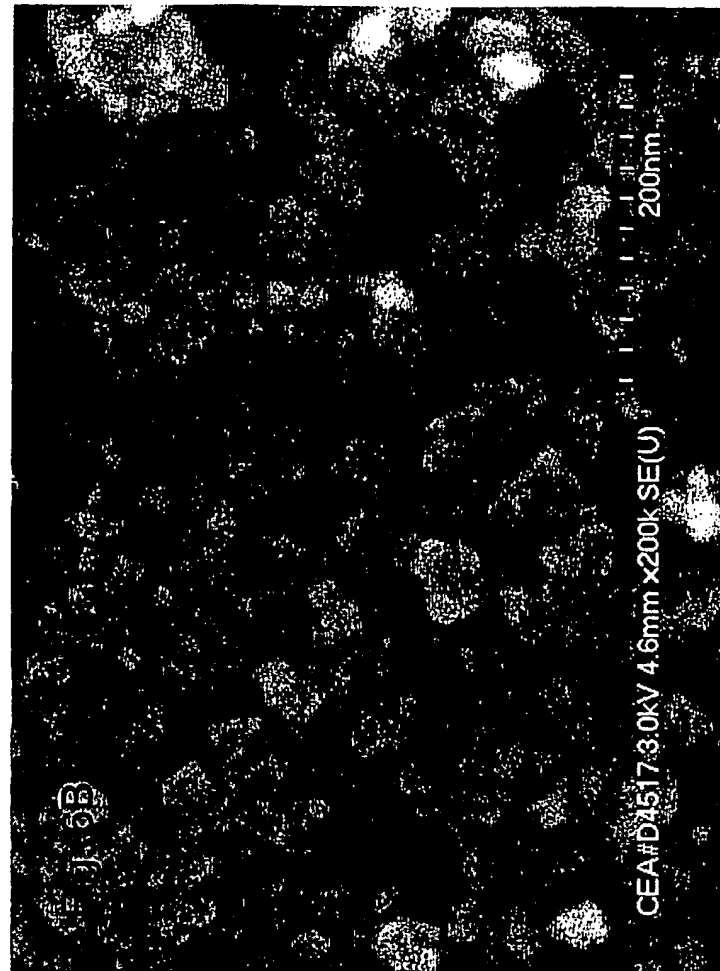
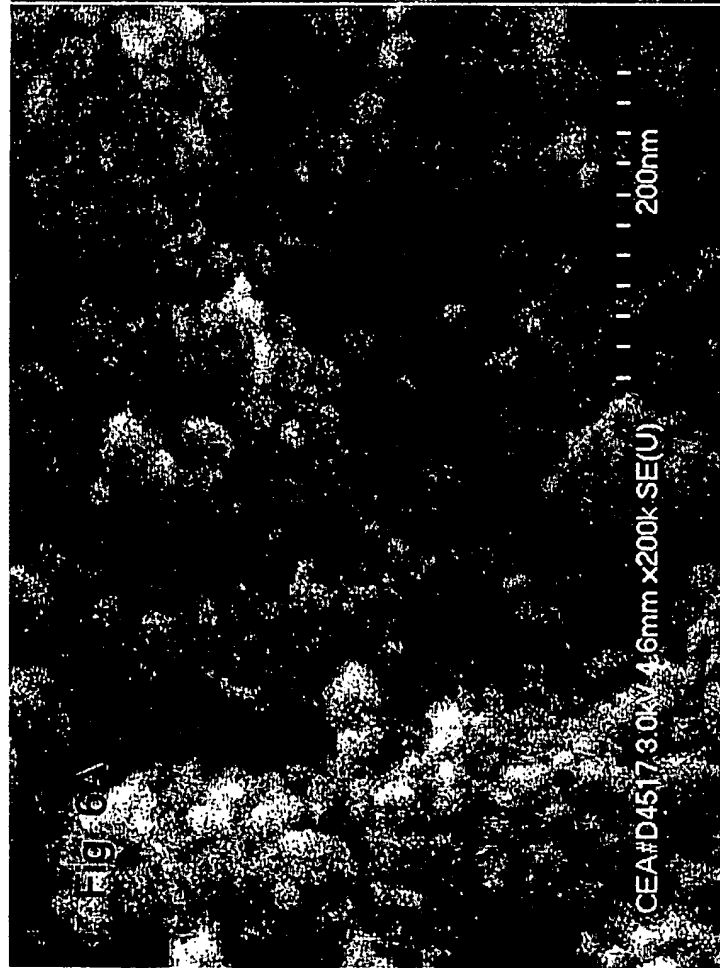
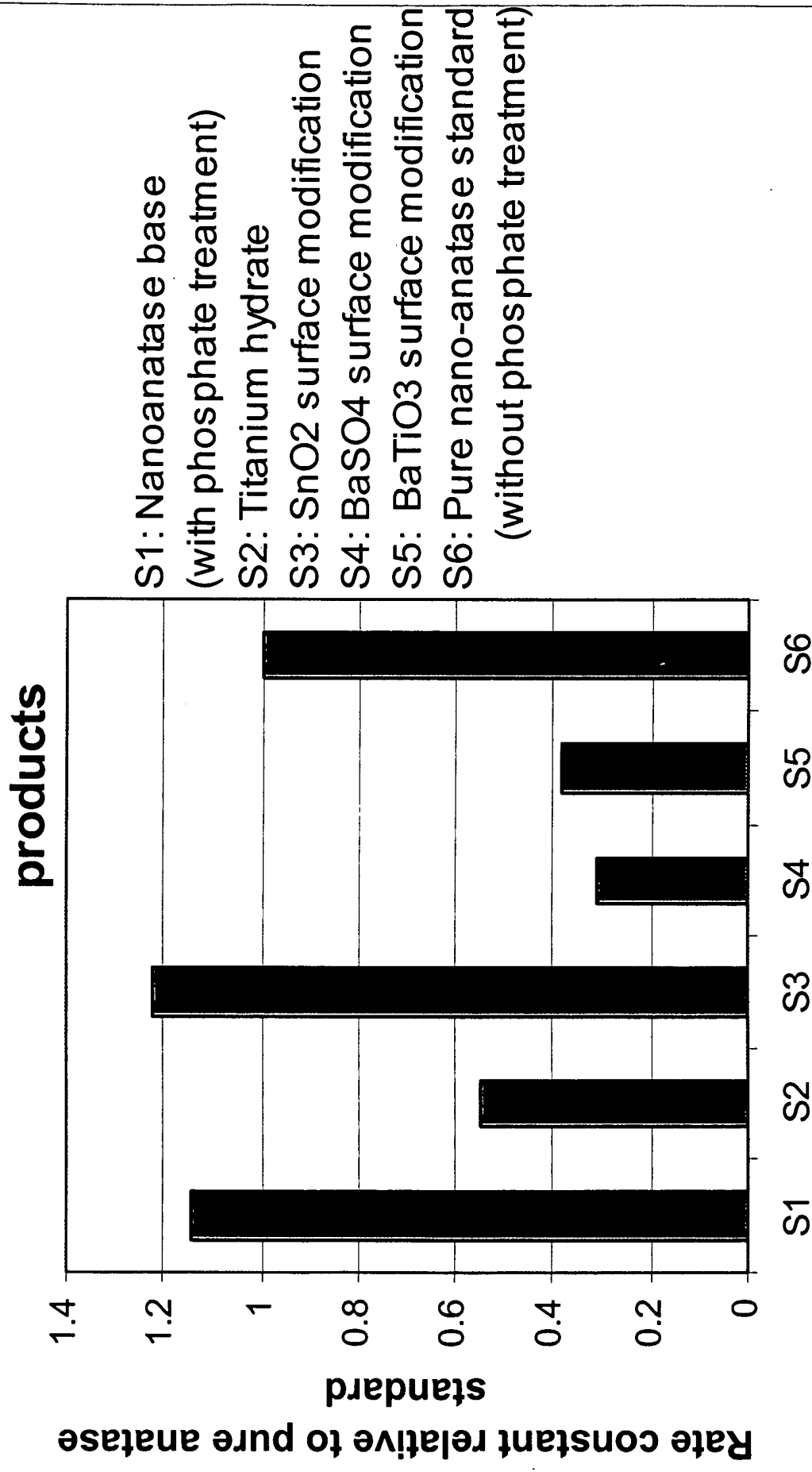


FIG. 7: Rate constants for the photochemical degradation of 4-CP on several surface-modified products



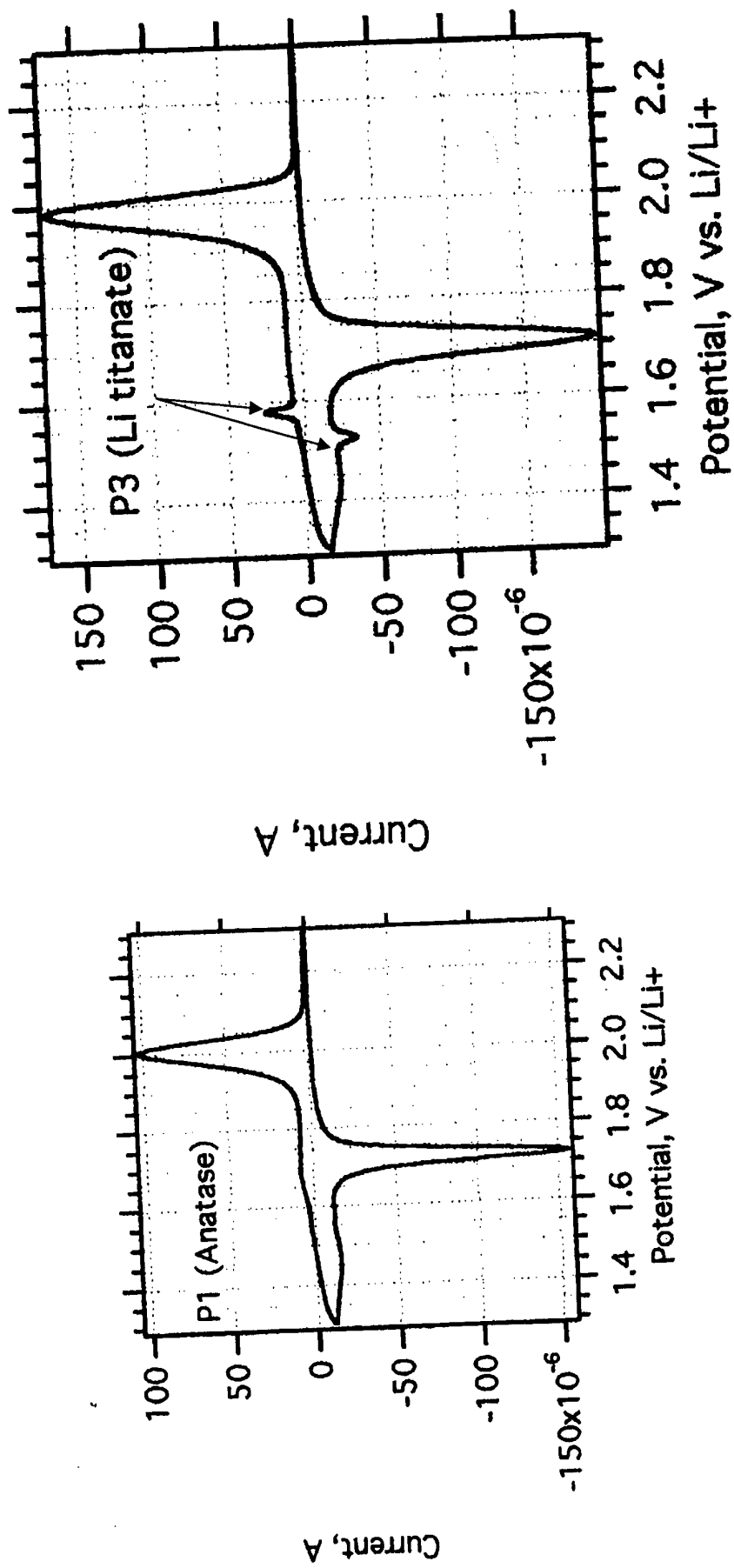


Fig. 8a

Electrochemical characterization of the surface composition using cyclic voltammetry. Lithium titanate surface modification with a significant electrochemical response.

Fig. 8b

Li-insertion test
 1M Li(CF₃SO₂)₂ + EC/DME
 CV - 0.1 mV/s

Li-insertion test; 1-M Li(CF₃SO₂)₂; CV - 0.1 mV

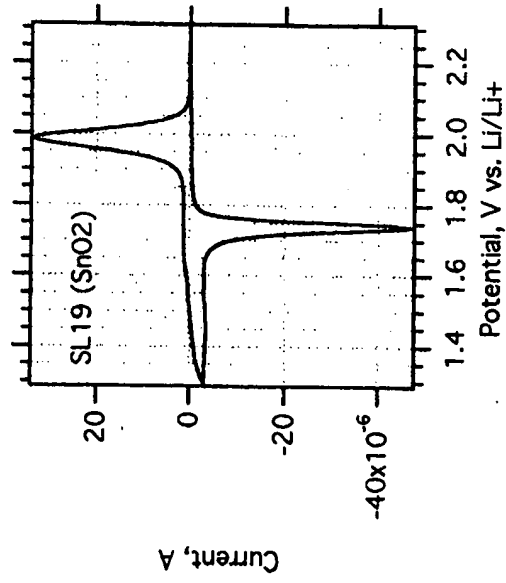


Fig. 9a

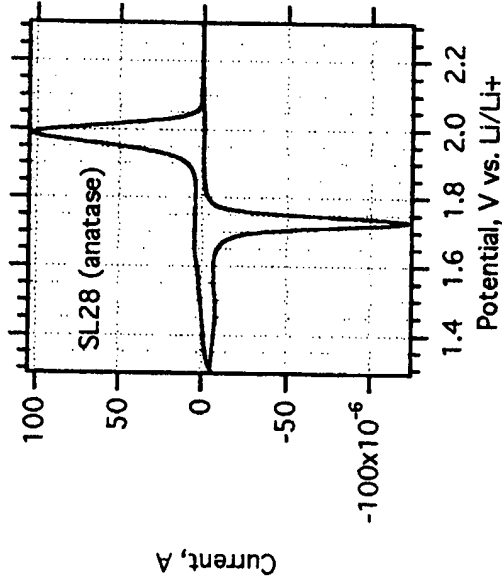


Fig. 9b

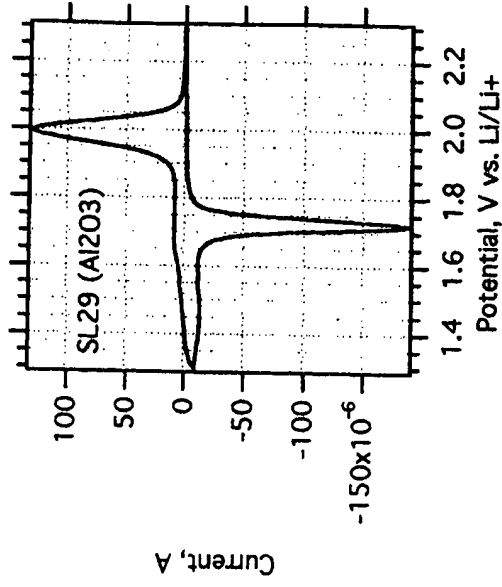


Fig. 9c

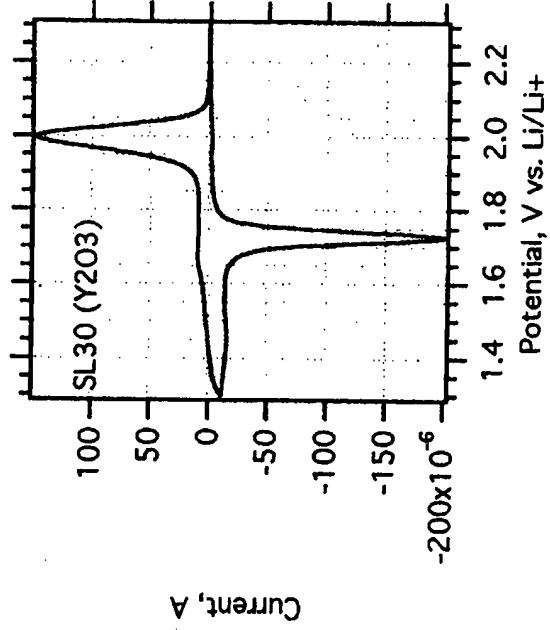


Fig. 9d

Fig. 9

Electrochemical characterization using cyclic voltammetry.
Surface modifications with no significant electrochemical response.

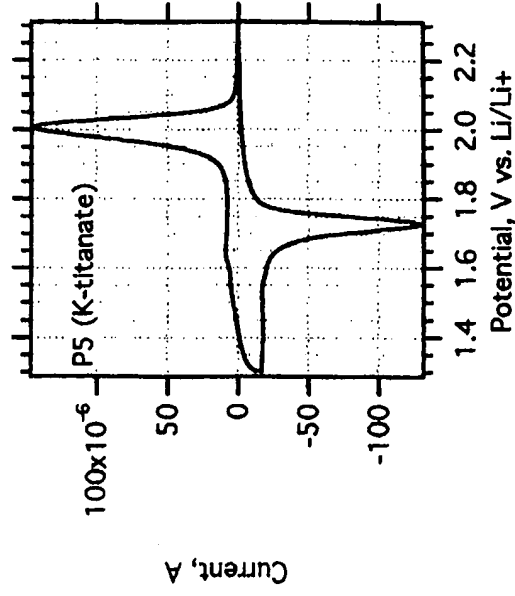
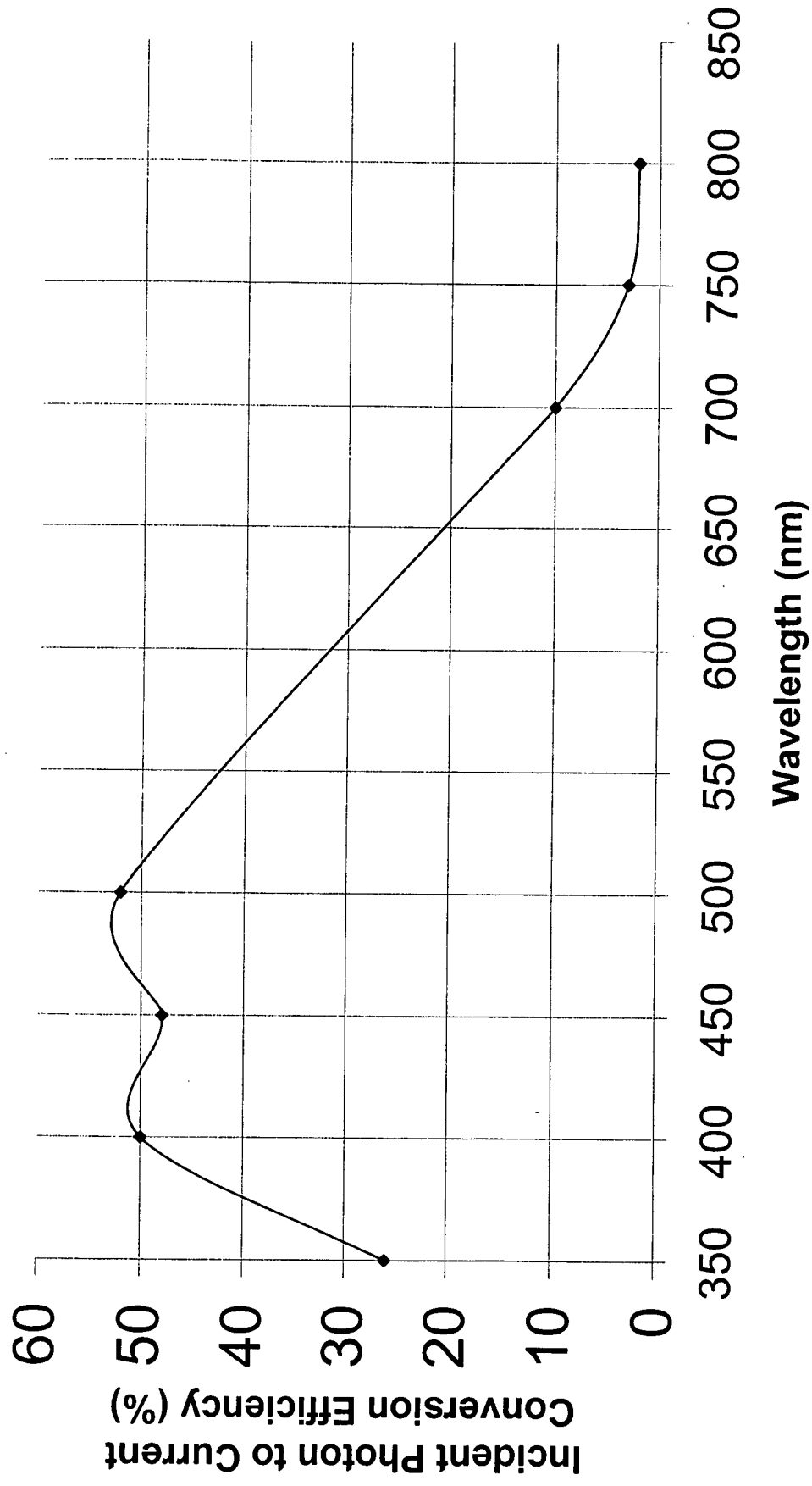
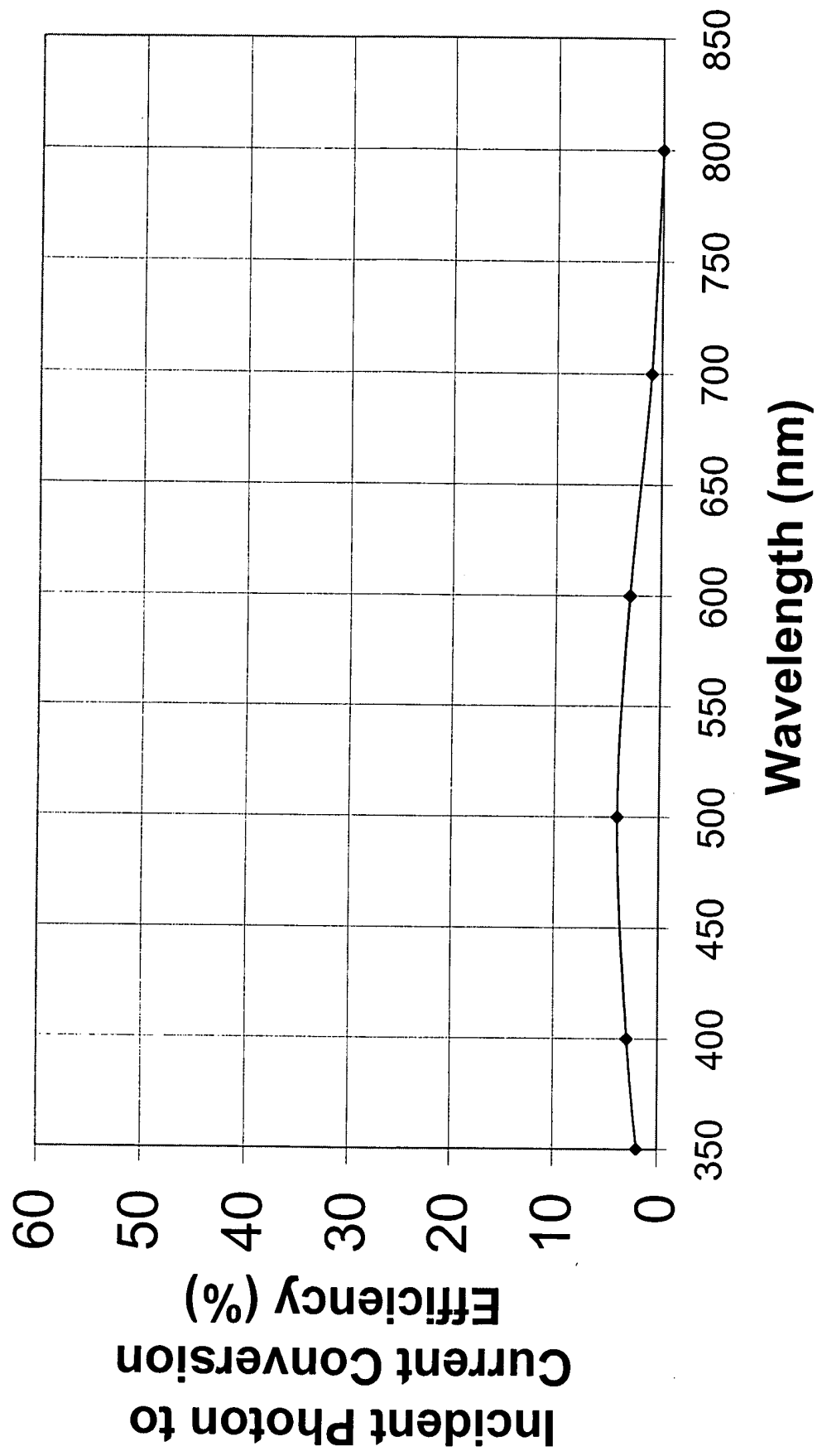


Fig. 9e

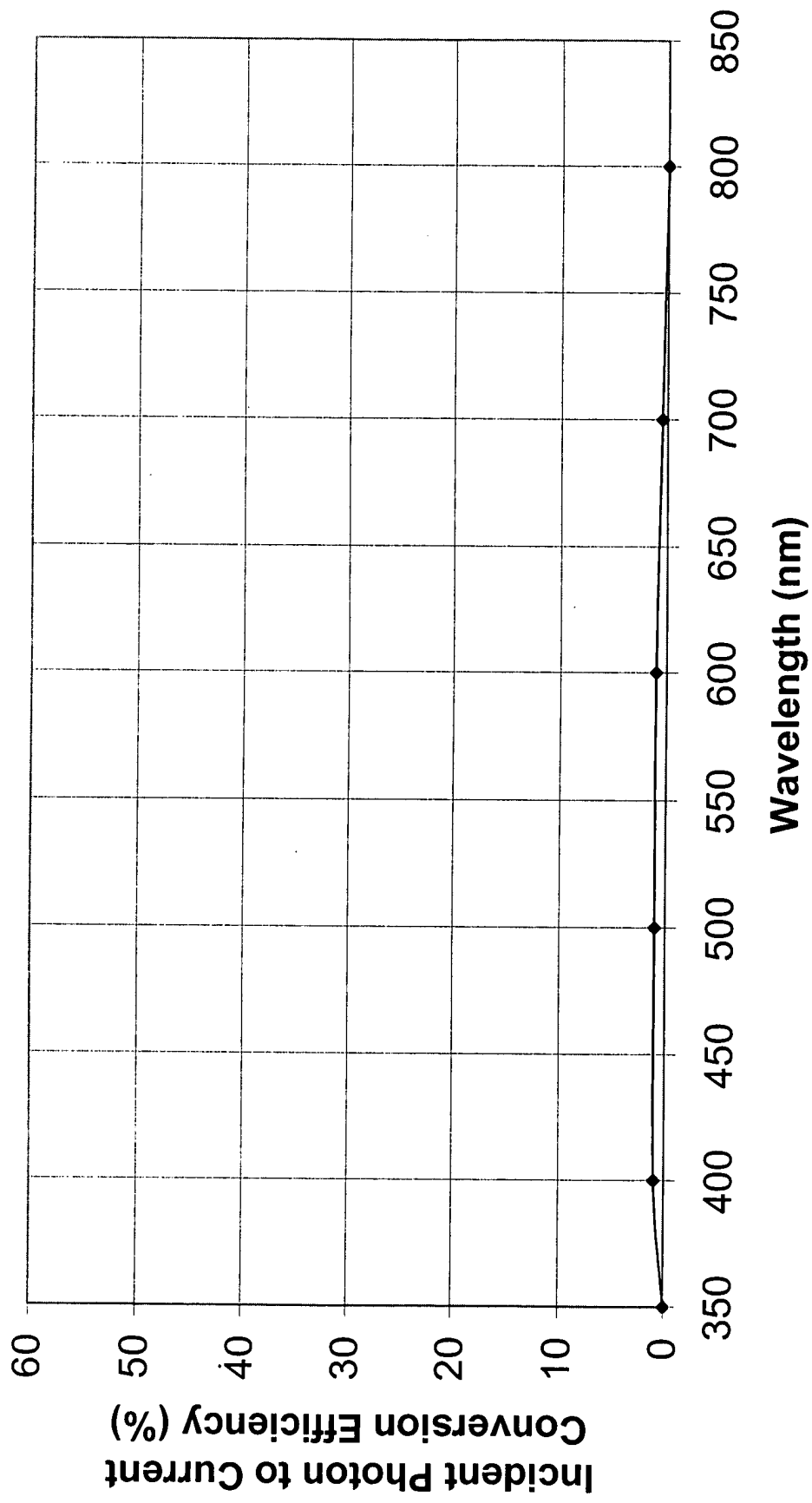
**Fig. 10A - Photochemical measurement of the calcined
nanoanatase base material for surface modification**



**Fig. 10B - Photochemical measurement of lithium
titanate modified surface**



**Fig. 10C - Photochemical measurement of potassium
titanate modified surface**



**Fig. 10D - Photochemical measurement of tin oxide
modified surface**

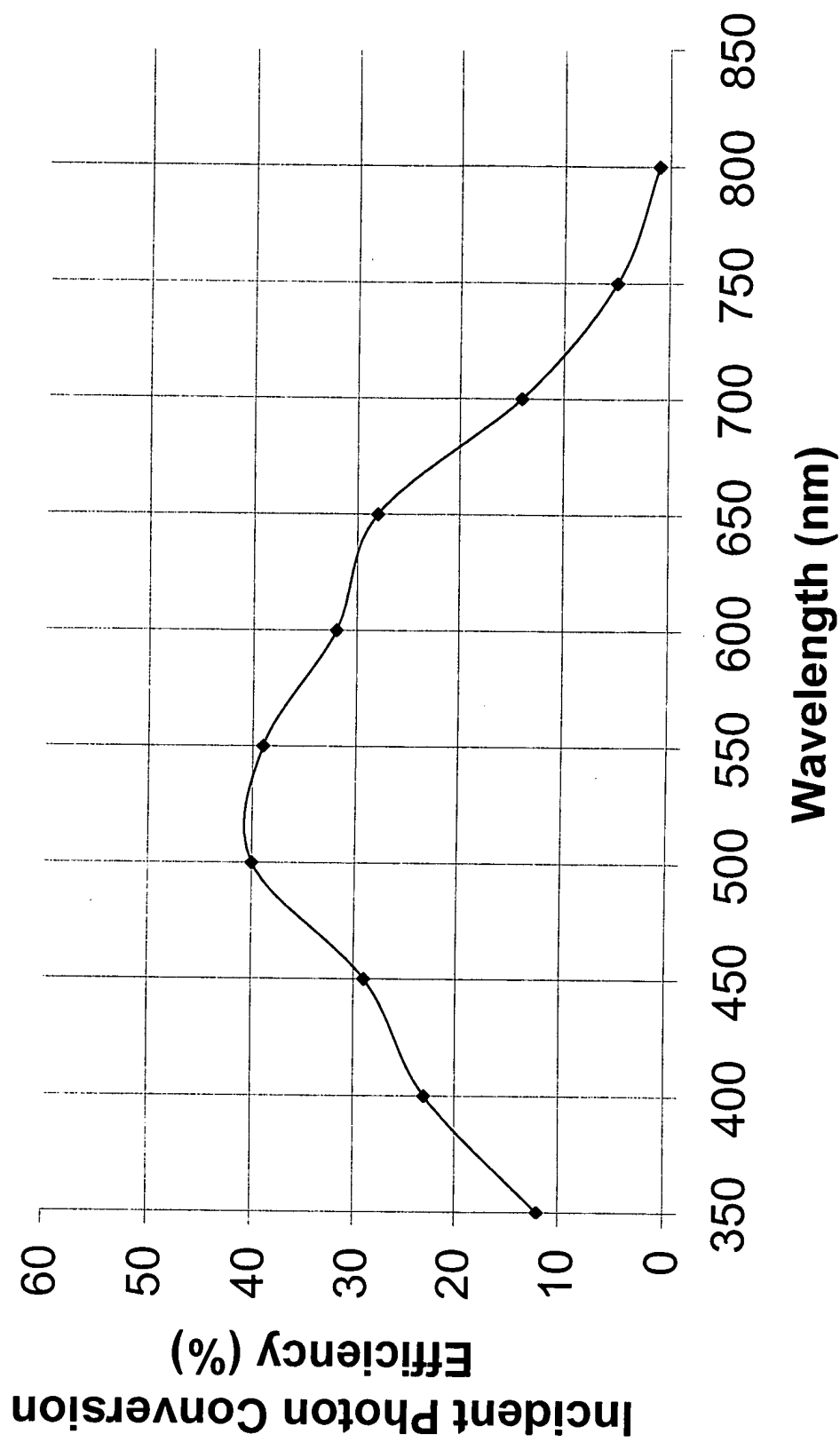


Fig. 11A – Photodegradation of 4-CP on nanoanatase with barium titanate surface layer, showing degradation of 4-CP and formation of intermediate degradation products

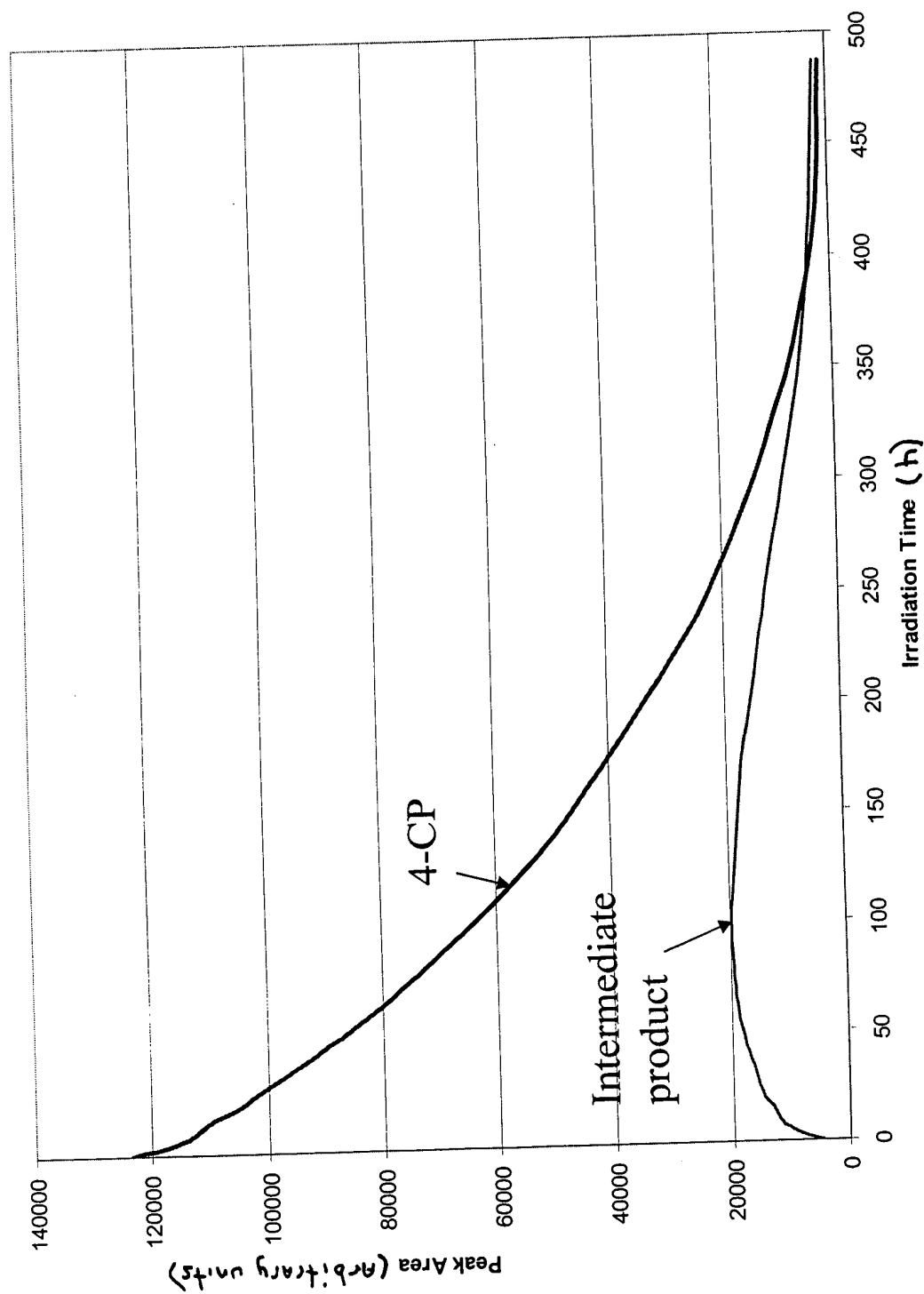


Fig. 11b: Photodegradation of 4-CP on nanoanatase base material, showing degradation of 4-CP and formation of intermediate degradation products

